

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>P-TARKET-019/WO</b>	<b>FOR FURTHER ACTION</b>	
		See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/053091</b>	International filing date ( <i>day/month/year</i> ) <b>25.11.2004</b>	Priority date ( <i>day/month/year</i> ) <b>17.12.2003</b>
<p>International Patent Classification (IPC) or national classification and IPC <b>INV. C09D5/24 D06N7/00 H05F3/02</b></p>		
<p>Applicant <b>TARKETT SAS</b></p>		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report  <input type="checkbox"/> Box No. II Priority  <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  <input type="checkbox"/> Box No. IV Lack of unity of invention  <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement  <input type="checkbox"/> Box No. VI Certain documents cited  <input type="checkbox"/> Box No. VII Certain defects in the international application  <input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand <b>08.04.2005</b>	Date of completion of this report <b>24.04.2006</b>	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer <b>Matthijssen, J-J</b> Telephone No. +31 70 340-3885	



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/053091

1AP20 Rec'd PCT/PTO 16 JUN 2006

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
  - a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

**Description, Pages**

1, 2, 4-6	as originally filed
3	received on 26.10.2005 with letter of 17.10.2005

**Claims, Numbers**

1-10	received on 26.10.2005 with letter of 17.10.2005
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- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
- 3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
- 4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/053091

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-10
	No: Claims	
Inventive step (IS)	Yes: Claims	1-10
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/EP2004/053091

**Re Item V.**

- 1 The following documents are referred to in this communication:  
D1 : EP 1 284 278 A (ROTTA GMBH) 19 February 2003 (2003-02-19)  
D2 : EP 0 409 099 A (FUJII KINZOKU KAKO KK ; OTA TAKASHI (JP)) 23 January 1991 (1991-01-23)  
D3 : US 4 419 279 A (ABRAMS JOHN C) 6 December 1983 (1983-12-06)  
D4: DE 102 00 292 A (WARMBIER WOLFGANG) 17 April 2003 (2003-04-17)
- 2 Document D1 discloses (the references in parentheses applying to this document):  
A conductive coating composition for textile materials comprising a PU polymer binder and 50-95 % wt. of a nobel metal coated sphere (§0009; 0025). The spheres are preferably coated with gold or silver and have a diameter of 1-150 µm (§0014-0015; 0017).  
Therefore, the subject matter of claim 1 is novel in view of D1.  
Consequently, also dependent claims 2-10 are novel.
- 3 Document D2 discloses (the references in parentheses applying to this document):  
An exothermic conductive coating composition comprising a polyurethane resin and spherical glass or resin particles coated with a metal, preferably silver, with a particle size of 4-350 µm (column 2, line 7-10; column 2, line 41 - column 3, line 6; column 3, line 19-54). The thickness of the coating film after curing is 0,1-3 mm (column 5, line 38-45). The conductive particle is comprised at 22-80 % wt. based on the total of the resin and the conductive particle (column 4, line 2-12).  
Therefore, the subject matter of claim 1 is novel in view of D2  
Consequently, also dependent claims 2-10 are novel.
- 4 Document D3 discloses (the references in parentheses applying to this document):  
A conductive paste, comprising 30-40 % wt. of silver coated glass spheres with a particle size of 1-100 µm, embedded in a UV curable polymeric matrix, to obtain a conductive coating on a substrate, such as a multi layer capacitor (column 2, line 30-

33; column 6, line 36-37; column 12, line 25-27).

Therefore, the subject matter of claim 1 is novel in view of D3.

Consequently, also dependent claims 2-10 are novel.

5 Document D4, which is considered to represent the most relevant state of the art, discloses a conductive floor covering (10) comprising conductive layer (14) and a dissipating layer (16) comprising silicon-carbid particles with a size of 0,5-3 mm, alternatively silicon or germanium particles or carbon fibres may be used. Layer (16) pertains to a scattered particle layer that is fixed to the underlying layer (14) with a resin-based sealing layer (18). D4 does not disclose the amount of particles from layer (16) relative to layer (14) and/or (18) as to arrive at a particle concentration. The subject-matter of claim 1 differs from this known conductive floor covering in that i) the particles contain a conductive coating, ii) have a particle size of 0,1-50  $\mu\text{m}$  and iii) are comprised at 0,01-10 % wt. The problem to be solved by the present application is to provide a floor covering having a top coating that is both conductive and transparent. Documents D1-D3 relate to conductive coating compositions having particles containing a conductive coating and a particle size in the range of 0,1-50  $\mu\text{m}$ . However, none of the documents D1-D3 discloses nor suggests to use a particle concentration of 0,01-10 % wt. in order to arrive at a transparent conductive coating. Therefore, the subject matter of claim 1 involves an inventive step. Consequently, also dependent claims 2-10 are inventive.

6 INDUSTRIAL APPLICABILITY

The present invention is applicable in the field of electrically conductive floor coverings.

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Mineral materials or conductive pigments can also be used to lower the electrical resistance, but they have generally a colouring effect on the coating.

### SUMMARY OF THE INVENTION

In accordance with the present invention, a surface covering comprising a substrate and a surface or top coating is provided for conductive flooring with a top coating exhibiting improved cleaning and maintenance properties as well as an good transparency.

Accordingly the invention provides a new and improved surface covering comprising a substrate and a top coating characterised in that the top coating comprises particles with a conductive coating having a mean particle size (in 10 numbers) between 0.1 and 50  $\mu\text{m}$ .

The conductive flooring with a top coating according to the invention exhibits improved cleaning and maintenance properties as well as an increased transparency. Furthermore the conductivity of the flooring remains constant during its entire lifetime.

According to a preferred embodiment, the particles are substantially spherical. Such spherical particles are more easily mixed with the top coating before the application of said top coating to the substrate.

The particles preferably comprise a coating of silver, aluminium, copper, nickel, gold or an alloy thereof with another metals. Metal-coated spherical beads 20 are especially preferred. Such a metal coating gives very good performances and allows to effectively lead any charges accumulating in the top coating down the substrate through which they are then lead to the ground.

The particles or the metal-coated spherical beads have a dry bulk resistivity of advantageously between 0.0001 and 0.01 Ohms/cm. Very good results are 25 achieved with metal-coated spherical beads having a dry bulk resistivity of about 0.001 Ohms/cm.

The top coating comprises between 0.01 and

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**Claims**

1. A surface covering comprising a substrate and a top coating characterised in that the top coating comprises between 0.01 and 10% w/w of particles with a conductive coating having a mean size between 0.1 and 50  $\mu\text{m}$ , based on the weight of the top coating.

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2. The surface covering according to claim 1, wherein the particles are substantially spherical.

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3. The surface covering according to claim 1 or 2, wherein the particles comprise a coating of silver, aluminum, copper, nickel, gold or an alloy thereof with another metals.

4. The surface covering according to any of the preceding claims, wherein the particles have a dry bulk resistivity of between 0.0001 and 0.01 Ohms/cm.

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5. The surface covering according to any of the preceding claims, wherein the top coating comprises a PU-dispersion, a PU-solution, a 2-components PU, a PU acrylate, an epoxy acrylate, a polyester acrylate, a polyether acrylate, a silicone acrylate or a mixture thereof

6. The surface covering of claim 5, wherein the coating comprises an urethane derived polymer preferably polyurethane.

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7. The surface covering of claim 5, wherein the coating comprises a water based UV-curable PU-acrylate dispersion with a dry content of between 5 % and 80% w/w, preferably between 20 and 60 % w/w.

8. The surface covering according to any of the preceding claims, wherein the top coating has a thickness of between 0.5  $\mu\text{m}$  to 100  $\mu\text{m}$

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9. The surface covering according to any of the preceding claims, wherein the substrate is a conductive and antistatic flooring.

10. The surface covering according to any of the preceding claims, wherein the substrate is a PVC, polyolefin or rubber based flooring with vertical conductive channels.

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